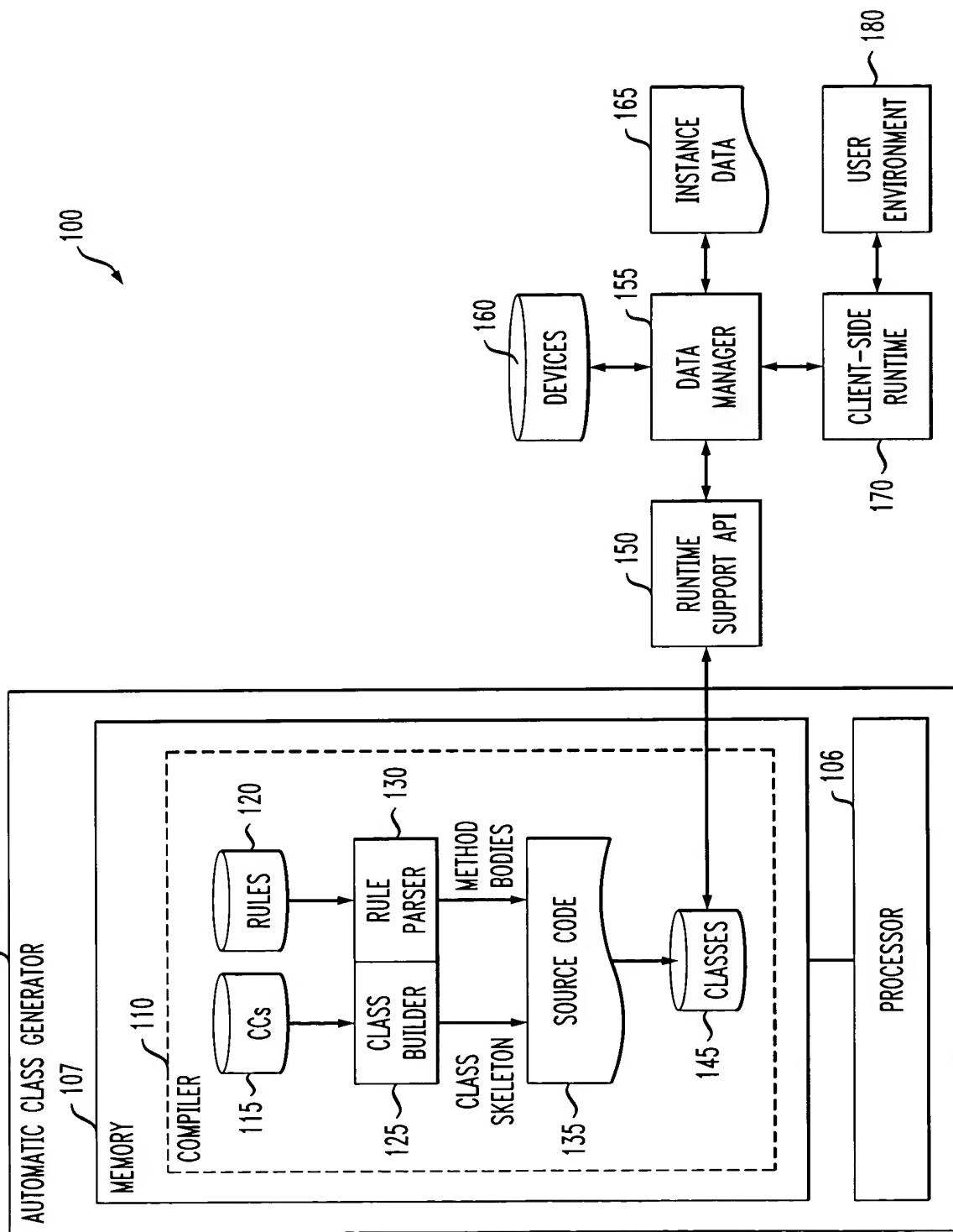




FIG. 1





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FIG. 2

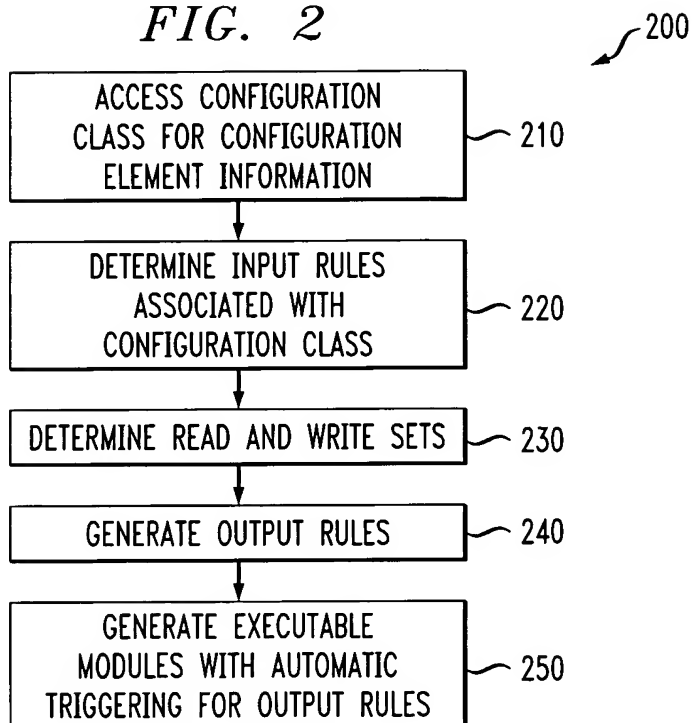


FIG. 3

```
<MOC className="SiteData" MOCVersion="1.0">
  <MOCElement name="server ID">
    <Type>
      <Int32 minValue="1" maxValue="100"/>
    </Type>
  </MOCElement>
  <MOCElement name="serverName">
    <Type>
      <String defaultValue=""/>
    </Type>
  </MOCElement>
  <MOCElement name="serverType">
    <Type>
      <EnumRef name="ServerTypeEnum"/>
    </Type>
  </MOCElement>
  <MOCElement name="serverAttr">
    <Type>
      <Attributes className="ServerComplexType" MOCVersion="1.0"/>
    </Type>
  </MOCElement>
</MOC>
```



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FIG. 4

```
<Typedef name="PnniAtmAddr"> <!-- a predefined type -->
  <Type>
    <OctetString maxLength="20" minLength="0" />
  </Type>
</Typedef>
<!-- A type defined in terms of another type -->
<Typedef name="ArrayedAtmAddr">
  <Type arrayLength="10">
    <UserDefType name="PnniAtmAddr"/> <!-- type defined above -->
  </Type>
</Typedef>

<!-- this is inside a MOC that uses the above type definition -->
<MOCElement name="atmAddress" visibility="public">
  <Type arrayLength="25">
    <UserDefType name="ArrayedAtmAddr"/>
  </Type>
</MOCElement>
```

FIG. 5

```
<MOC className="SiteData">
  <ExplicitRule name="iEMS_defaultValueRule"><![CDATA[
    public void iEMS_defaultValueRule()
    {
      serverID = 100;
      serverName = "HCFS1";
      serverType = D_serverType_hcf;
    }
  ]]>
  </ExplicitRule>
  <MOCElement name="serverName">
    <ImplicitRule name="iEMS_validationRule"><![CDATA[
      public void iEMS_validationRule()
      {
        // details of this rule are shown later.
      }
    ]]>
    </ImplicitRule>
  </MOCElement>
  ...
</MOC>
```



FIG. 6

```
public class SiteData_1_0 {  
    public int serverType;  
    public int server ID;  
    public ServerComplexType_1_0 serverAttr = new ServerComplexType_1_0(this, "serverAttr");  
    public String serverName;  
    ...  
}
```

FIG. 7

```
public class SiteData_1_0 //the 1_0 is the version  
{  
    ...  
    public String serverName_get() {  
        return this.serverName;  
    }  
    public int serverType_get() {  
        return this.serverType;  
    }  
    public ServerComplexType_1_0 serverAttr_get() {  
        return this.serverAttr;  
    }  
    public int serverID_get() {  
        return this.serverID;  
    }  
    ...  
}
```



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FIG. 8

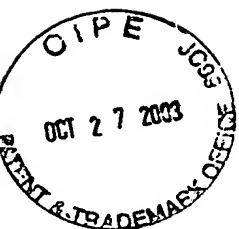
```
public class SiteData_1_0
{
    ...
    public void serverAttr_set(ServerComplexType_1_0 v) throws Exception {
        this.serverAttr = v;
        addToUpdateList("serverAttr", v, null);
    }

    public void serverName_set(String v) throws Exception {
        this.serverName = v;
        addToUpdateList("serverName", v, null);
    }
    ...
}
```

FIG. 9

```
public class SiteData_1_0
{
    ...
    public void serverName_update(String v) throws Exception {
        this.serverName = v;
        addToUpdateList("serverName", v, null);
    }

    public void serverAttr_update(ServerComplexType_1_0 v) throws Exception {
        this.serverAttr = v;
        addToUpdateList("serverAttr", v, null);
    }
    ...
}
```



6/8

FIG. 10

```
<MOCElement name="serverName">
  <ImplicitRule name="iEMS_validationRule"><![CDATA[
    public void iEMS_validationRule()
    {
      if(serverID < 1 || serverID > 250)
        throw new RuntimeException("serverID length error");
      if(serverType != D_serverType_hcf)
        throw new RuntimeException("serverType error");
    }
  ]]>
</ImplicitRule>
</MOCElement>
```

FIG. 11

```
public void serverType_set(int v) throws Exception {
    //validate range -- omitted for space
    this.serverType = v;
    addToUpdateList("serverType", new Integer(v) , null);
    addTrigger(this, "serverName_iEMS_validationRule");
}

public void serverID_set(int v) throws Exception {
    //validate range -- omitted for space
    this.serverID = v;
    addToUpdateList("serverID", new Integer(v) , null);
    serverID_iEMS_modificationRule();
    addTrigger(this, "serverName_iEMS_validationRule");
}

public void serverType_update(int v) throws Exception {
    //validate range -- omitted for space
    this.serverType = v;
    addToUpdateList("serverType", new Integer(v) , null);
    serverName_iEMS_validationRule();
}

public void serverID_update(int v) throws Exception {
    //validate range -- omitted for space
    this.serverID = v;
    addToUpdateList("serverID", new Integer(v) , null);
    serverName_iEMS_validationRule();
}
```

1110

1120



FIG. 12

```
<MOCElement name="serverID">
  <ExplicitRule name="iEMS_modificationRule"><![CDATA[
    public void iEMS_modificationRule() throws IEMSEException {
      try{          // dummy modification rules
        if(serverID == 3)
          serverName_set("Three");
        if(serverID == 4)
          serverName_set("Four");
      }
      catch(Throwable t){
        throw new IEMSEException(t);
      }
    }
  ]]>
</ExplicitRule>
</MOCElement>
```

1210

```
public NameValuePair[] triggerAlliEMS_modificationRule() throws Exception {
  NameValuePair[] values = new NameValuePair[1];
  serverID_iEMS_modificationRule();
  values[0] = new NameValuePair("serverID_iEMS_modificationRule", null);
  return values;
}
```

1220



FIG. 13

```
<ExplicitRule name="iEMS_defaultValueRule"><![CDATA[
    public void iEMS_defaultValueRule()
    {
        serverID=100;
        serverName="HCFS1";
        serverType=D_serverType_hcf;
        ...
    }]]>
```

1310

```
public void iEMS_defaultValueRule()
{
    serverID=serverID_checkValue(100); //for range and integrity constraint
                                     //preservation
    //record this update to serverID -- omitted for clarity
    serverName=serverName_checkValue("HCFS1");
    //record update to serverName
    serverType=serverType_checkValue(D_serverType_hcf);
    //record update to serverType
}
```

1320